

ADVANCE PROGRAM

**THIRTY-SECOND ANNUAL
PRECISE TIME AND TIME INTERVAL (PTTI)
SYSTEMS AND APPLICATIONS MEETING**

November 28-30, 2000



32 Years of Progress
1969-2000

Hyatt Regency Hotel
Reston, Virginia

The Schedule

Monday, November 27, 2000

0800-1300	Pipe and Drape Set-Up for Exhibitors
0830-1600	Navtech Seminars Tutorials
1300-2000	Exhibitor Set-Up
1900-2100	Registration - PTTI Meeting*
1900-2100	Committee on GPS and GLONASS Time Transfer Standards

Tuesday, November 28, 2000

0700-0800	Speakers' Breakfast
0700-1500	Speakers' Room Open
0700-0800	Attendees' Breakfast
0715-1600	Registration - Grand Ballroom Foyer
0800-1700	Technical Exhibits
0800-0900	Opening Session and Keynote
0900-1030	Session I
1030-1050	Intermission - Exhibits Area
1050-1150	Session II
1150-1320	Attendees' Lunch
1320-1440	Session III
1440-1500	Intermission - Exhibits Area
1500-1620	Session III (con't)
1620-1720	Session IV
1830-2030	Reception

Wednesday, November 29, 2000

0700-0800	Speakers' Breakfast
0700-1600	Speakers' Room
0700-0800	Attendees' Breakfast
0800-1600	Registration
0800-1700	Technical Exhibits
0800-0920	Session V
0920-1020	Session VI
1020-1040	Intermission - Exhibits Area
1040-1140	Session VII
1140-1300	Attendees' Lunch
1300-1420	Session VIII
1420-1440	Intermission - Exhibits Area
1440-1640	Poster Session
1730-1830	Joint PTTI Executive Board and Advisory Board Meeting
1900-2030	Evening Speaker

Thursday, November 30, 2000

0700-0800	Speakers' Breakfast
0700-1200	Speakers' Room
0700-0800	Breakfast
0800-1000	Registration
0800-1000	Session IX
1000-1020	Intermission - Pre-Function Area
1020-1140	Session X
1140-1150	Closing Session
1150-1200	Close of Meeting

*Registration for the PTTI Meeting is available each day. Exhibits will be open Tuesday and Wednesday only.

REGISTRATION CARD
32nd ANNUAL
PRECISE TIME AND TIME INTERVAL
SYSTEMS AND APPLICATIONS
NOVEMBER 28-30, 2000

NAME _____
First Name Initial Last Name

AGENCY _____
Company or Organization

ADDRESS _____
Street

City, State or Country

TELEPHONE _____ FAX _____

E-MAIL _____

Registration (will pay on-site)

Registration – Amount Enclosed \$ _____

† \$250.00 if postmarked on or before November 1, \$275.00 thereafter;

‡ Student/Retiree fee - \$50.00

Hardcopy of Proceedings (\$35.00) - Amount Enclosed \$ _____

Will attend Reception Additional Reception Tickets (\$30 each)

Guest Breakfast Tickets (\$20 ea.) Guest Lunch Tickets (\$25 ea.)

No. _____ Amount Enclosed \$ _____

Additional copies of the Proceedings (\$100 each)

Amount Enclosed \$ _____

(Mark here if purchasing Proceedings only)

† Covers entry to all sessions, one Reception ticket, and one copy of the Proceedings on CD in Adobe Acrobat (pdf) format

‡ Must be fully retired or full-time student to qualify for the reduced registration fee. Covers entry to sessions and exhibits only.

Make checks payable to Treasurer, PTTI; This year PTTI will accept credit card payments only through the PTTI website. Please see the website for details. Credit cards cannot be accepted at the registration desk.

Speaker
Session Chairman

Exhibitor

Questions? Contact Ms. Jardine at 202-762-1414 or
nikki@spica.usno.navy.mil

Place
Stamp
Here

Ms. Nicolette Jardine
PTTI Registration
U.S. Naval Observatory
Time Service Department
3450 Massachusetts Avenue, NW
Washington, D.C. 20392-5420

ADVANCE PROGRAM

**THIRTY-SECOND ANNUAL
PRECISE TIME AND TIME INTERVAL (PTTI)
SYSTEMS AND APPLICATIONS MEETING**

Sponsored by

U.S. Naval Observatory
U.S. Naval Research Laboratory
NASA Jet Propulsion Laboratory
U.S. Air Force Office of Scientific Research
Defense Information Systems Agency
U.S. Coast Guard Navigation Center
U.S. Army Research Office

November 28-30, 2000



Hyatt Regency Hotel
Reston, Virginia

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OBJECTIVES

The objectives of the PTTI Systems and Applications Meetings are to:

- Disseminate and coordinate PTTI information at the user level
- Review present and future PTTI requirements
- Inform Government and Industry engineers, technicians, and managers of precise time and frequency technology and its problems
- Provide an opportunity for an active exchange of new technology associated with PTTI

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This year, PTTI 2000 addresses:

- Advances in Frequency and Timing Systems
- Telecommunications, Utilities, Internet Protocol, and Network Timing
- GPS, GLONASS and Two-Way Satellite Time Transfer
- WAAS, EGNOS and MSAS GPS Augmentation Systems
- Time Scales
- Panel Discussion: Leap Second and Future Considerations
- Future Timing and Frequency Applications
- PTTI Vendor Presentations

WELCOME TO PTTI 2000

MEETING INFORMATION

Registration

Please send the PTTI registration form to:

Ms. Nicolette Jardine
PTTI Registration
U.S. Naval Observatory
Time Service Department
3450 Massachusetts Avenue, N.W.
Washington, D.C. 20393-5420
202-762-1414 FAX 202-762-1511
e-mail: jardine.nicolette@usno.navy.mil

The registration fee is \$275.00. Note: If payment is received postmarked before November 1, 2000 the cost is \$250.00.

The full registration fee includes entry to all the sessions, the exhibit area, a copy of the Proceedings, the welcoming reception, breakfast and lunch on Tuesday and Wednesday, breakfast Thursday, and a special presentation on Wednesday evening. Guest tickets are \$30.00 for the reception, \$20.00 for breakfast and \$25.00 for lunch.

The registration fee for students and full-time retirees is \$50.00 and includes entry to the scientific sessions and the exhibit area only. It does not include a copy of the Proceedings, entry to breakfasts, lunches, the reception, or the Wednesday evening special presentation.

Please make checks payable to: Treasurer, PTTI. This year PTTI will accept credit card payments only through the PTTI website. Please see the website for details. Credit cards cannot be accepted at the registration desk. Attendees, including presenters and exhibitors, must register and receive a badge and badges must be worn for admission to all sessions and functions. Badges for registered attendees are not transferable.

Visitor badges for the exhibit area only may be obtained at the registration desk. The exhibit area is open to everyone.

PTTI 2000 proceedings will be provided on a CD in Adobe Acrobat (pdf) format. For those wishing to have a hardcopy version instead, a printed copy may be requested for an additional \$35 at the time of registration.

Cancellation Policy

All requests for cancellation must be received in writing before November 8, 2000. On or after November 8th there is a \$140.00 cancellation fee. Refunds are not given for "no shows"; however, substitutions are allowed.

PTTI 2000 Home Page

Access the PTTI 2000 Home Page from the World Wide Web at:

<http://tycho.usno.navy.mil/ptti.html>

PTTI 2000 on-line registration is also available via the PTTI Home Page.

<http://tycho.usno.navy.mil/pttiregform.html>

Please remember to take advantage of the early registration fee. Payment has to be received postmarked on or before November 1, 2000.

PTTI 2000 Tutorials

Navtech Seminars will offer tutorials prior to the PTTI 2000 technical sessions on Monday, November 27, 2000.

The tutorial sessions planned are:

Morning Session

Time and Time Transfer with GPS (D. Matsakis)

- What is Time? (definitions and concepts)
- Description and performance of physical clocks
- Clock Characterization
- Time Scales and Clock Steering
- Time Transfer Techniques
- Future Accuracy Requirements and Technologies

Afternoon Session

GPS Carrier Phase Techniques for Timing Applications (J. Levine)

Who should attend:

- Those who are implementing or considering implementing timing systems for their applications.
- Professionals wanting background information on recent developments in the PTTI field.
- Conference attendees wishing to enhance their understanding of the technical sessions and exhibits at the PTTI meeting.

Full details will be available on the Navtech Seminars website <http://navtechgps.com>. Please register directly with Navtech Seminars. Cost \$575 for full day, \$295 for half day.

Navtech Seminars and GPS Supply
6121 Lincolnia Road, Suite 400
Alexandria, VA 22312-2707 USA
Tel: 703-256-8900
Fax: 703-256-8988
Toll free Canada and US: 1-800-628-0885
E-mail: courses@navtechgps.com
Web: <http://navtechgps.com/>

Questions

Please contact the following people for:

Technical/Scientific: Dr. Joseph White, 202-767-5111 or
white@juno.nrl.navy.mil

Exhibits: Mr. Don Mitchell, 707-528-1230 x118 or
dmitchell@truetime.com

General: Mrs. Sheila Faulkner, 703-532-6411 or
bopenyan@aol.com

Registration: Ms. Nikki Jardine, 202-762-1414 or
jardine.nicolette@usno.navy.mil

Registration Desk Hours

The registration desk will be open during the following hours:

27 November, Monday	- 1900 - 2100
28 November, Tuesday	- 0715 - 1600
29 November, Wednesday	- 0800 - 1600
30 November, Thursday	- 0800 - 1000

Hotel Reservations

Mail or fax the hotel reservation card (found in the back of the book) to:

The Hyatt Regency Hotel at Reston Town Center
(PTTI 2000 Meeting Room Block)
1800 Presidents Street
Reston Town Center
Reston, Virginia 20190
703-709-1234
Fax 703-709-2291

If reservations are made by telephone, mention PTTI 2000 to receive the special sleeping room rate. The PTTI rate is available from November 24 through December 2, 2000.

Check-in time is 1500 and check-out time is Noon. Rooms are held until 1600 (4:00 p.m. EST if not guaranteed for late arrival by a credit card or one night's deposit). The block of reserved rooms will be released November 13 so register early. If rooms are available after that date, reservations will be accepted at the group rate. If you leave before your scheduled departure date without informing the Hyatt, you will be charged an early departure fee. The area offers a wide range of restaurants and shops.

Transportation

Airlines

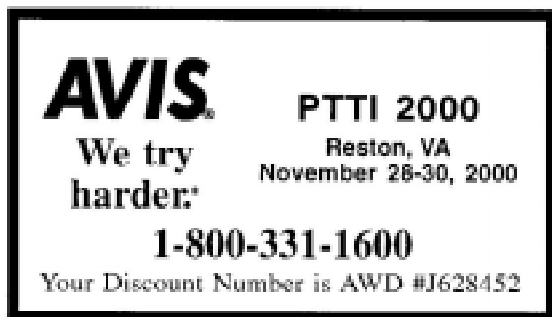
United Airlines has been chosen as the official carrier for **PTTI 2000** and is pleased to offer the best available airfares and schedules that fit your travel needs.

To obtain the best fares or schedule information, please call United's Meeting Desk at 1-800-521-4041. Reservationists are on duty 7 days a week from 0700 to Midnight EST. Please be sure to reference ID number 543ZO. The fares are available from November 25 through December 3, 2000. You or your travel agent should call without delay, as seats may be limited.

An additional 5% discount is available if you book and purchase a ticket at least 60 days in advance of the contracted travel dates. This increases the discount to 5% plus 5% off the lowest applicable fare or 10% plus 5% off the unrestricted coach fare.

Rental Car

Avis has been chosen as the official rent-a-car company for **PTTI 2000**. To receive a reduced rate, call **1-800-331-1600** to book your reservation and give the Avis Meeting Sales Agent the Avis Worldwide Discount (AWD) number for PTTI 2000 - **J628452**. Special meeting rates are available one week before and one week after the meeting and include unlimited free mileage.



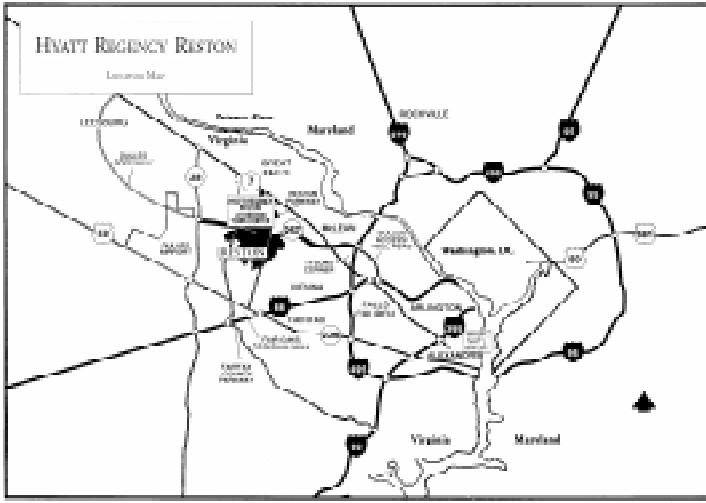
Airport Shuttle

Complimentary hotel shuttle service is available from Dulles airport.

Parking

Self and valet parking is available at the hotel. Parking for overnight guests; Self Parking is complimentary; valet parking is \$7.00 (day only) and \$14.00 overnight and includes unlimited in and out privileges

Directions



DIRECTIONS TO HYATT REGENCY RESTON FROM:

Washington National Airport & Washington, DC —

Follow signs to 1-66 West. (Be alert to late afternoon HOV restrictions.) From 1-66 West, take Exit 67, Dulles Airport Toll Road and follow it west to Exit 12, Reston Parkway. Turn right and continue ¼ mile to second stop light. Hotel is on the left.

Baltimore/New York —

Follow 1-95 South to Washington DC beltway then exit right (west) onto 1-495. Follow 1-495 across the Potomac River into Virginia and exit right onto Rt. 267, Dulles Toll Road. At Reston, use Exit 12, Reston Parkway; turn right and proceed ¼ mile to second stoplight. Hotel is on the left.

Fredericksburg/Richmond —

Follow 1-95 North to Washington, DC beltway (at Springfield), then exit onto 1-495 (north). Follow 1-495 to Rt. 267, Dulles Toll Road. At Reston, use Exit 12, Reston Parkway; turn right and proceed ¼ mile to second stoplight. Hotel is on the left.

Dulles International Airport —

From airport take Dulles Access Road East toward Washington, DC. At Reston, take Exit 12, then left onto Reston Parkway and follow it north ¼ mile to third stoplight. The hotel is on the left.

Leesburg/Loudoun County —

Two choices: (A) Follow Rt. 7 East to Dranesville and turn right onto Reston Parkway (Rt. 602). Proceed south approximately 3 miles. Hotel will be on the right. (B) Take Dulles Greenway Toll Road East past Dulles International Airport to Exit 12, Reston Parkway. Turn left onto Reston Parkway and follow it north ¼ mile to third stoplight. Hotel is on the left.

I-81 Corridor (North) — Hagerstown, Winchester —

Follow 1-81 South to Winchester and exit onto Rt. 7 East. Follow Rt. 7 eastbound for approximately 50 miles to Dranesville and then turn right onto Reston Parkway (Rt. 602). Proceed south for approximately 3 miles. Hotel will be on the right.

I-81 Corridor (South) — Roanoke, Harrisonburg —

Follow 1-81 North to the Strasburg area then exit onto 1-66 East and go approximately 58 miles. After passing Rt. 28, look for and exit onto the Fairfax County Parkway and follow it north to the end. Exit right onto Sunset Hills Rd. East and proceed 1 mile to Reston Parkway. Turn left and hotel will be one block on the left.

Messages

Messages may be left for PTTI attendees through the hotel's telephone number of 1-703-709-1234.

Exhibit Information

The exhibit area is adjacent to the general session. For exhibit information, please contact:

Don Mitchell
TrueTime, Inc.
2835 Duke Court
Santa Rosa, California 95407
707-528-1230
Fax 707-527-6640
email: dmitchell@truetime.com

List of Potential Exhibitors for PTTI 2000

Absolute Time
Agilent Technologies
Allen Osborne Associates
Arbiter Systems, Inc.
Brandywine Communications
Datum
Femtosecond Systems
Frequency Electronics, Inc.
GPS World
Guide Technology
Magellan Ashtech Products
Motorola
Oscilloquartz
Perkin Elmer
Composants Quartz & Electronique
Quartzlock, U.K., Ltd.
Septentrio Satellite Navigation
SpectraDynamics, Inc.
Spectrum Geophysical Instruments
Stanford Research Systems
Sytonics LLC
Techtrol Cyclonetics, Inc.
Temex Electronics
3S Navigation
Timing Solutions Corp.
TIMETECH GmbH
TRAK
Trimble
TrueTime, Inc.
Zyfer, Inc. (Odetics Telecom)

Speakers' Room

Please check the PTTI Registration Desk or the hotel's Function Board for the location of the Speakers' Room. Session chairs should alert their sessions' members to meet them in the Speakers' Room for the Speakers' Breakfast that is served each day. Beverages and speaker supplies are available during the day.

Presented Papers

Papers in camera-ready form must be submitted to Dr. Lee A. Breakiron, Editorial Chairman, by November 28, 2000, unless prior arrangements have been made with him. If prior arrangements have not been made, the paper will not be published in the Proceedings.

Proceedings

The proceedings will be mailed to the attendees in 2001. If you cannot attend, but wish to reserve a copy of the Proceedings, please return the Registration Card with a check for \$275.00 made out to Treasurer, PTTI. Please note on the card that you are not attending. Your reserved copy will be then sent to you. If you wish extra copies, they will also be available at \$100.00.

Temperature

The climate during late November and early December in the Washington, DC area could be cool. A light coat or raincoat is recommended.

Thirty-third Annual PTTI Meeting

The 33rd Annual PTTI Meeting will be held at the Hyatt Regency Hotel, Long Beach, California, November 27-29, 2001.

PTTI EXECUTIVE COMMITTEE

Dr. Joseph D. White, Chairman
U.S. Naval Research Laboratory

Mr. Ronald L. Beard
U.S. Naval Research Laboratory

Dr. Lee A. Breakiron
U.S. Naval Observatory

Lieutenant David Fowler
U.S. Coast Guard

Dr. Dennis D. McCarthy
U.S. Naval Observatory

Captain Thomas R. Rice
U.S. Coast Guard

Mr. William J. Ryan
Defense Information Systems Agency

Dr. Howard Schlossberg
Deputy Assistant Secretary Air Force/AQR

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NASA Jet Propulsion Laboratory

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Datum, Timing -Test & Measurement

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U.S. Naval Observatory

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NASA Jet Propulsion Laboratory

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MRS. SHEILA FAULKNER

SFA, Inc.

SUPPORT ASSISTANCE

Ms. Nicolette Jardine

U.S. Naval Observatory

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DR. LEONARD S. CUTLER

Agilent Laboratories

DR. DENNIS McCARTHY

U.S. Naval Observatory

MR. DON H. MITCHELL

TrueTime, Inc.

DR. RICHARD L. SYDNOR

NASA Jet Propulsion Laboratory

RECIPIENTS

OF THE

DISTINGUISHED PTTI SERVICE AWARD

1994

DR. GERNOT M. R. WINKLER

U.S. Naval Observatory (Retired)

1995

DR. JAMES A. BARNES

National Institute of Standards and Technology (Retired)

1996

PROFESSOR SIGFRIDO M. LESCHIUTTA

Politecnico di Torino

and

Istituto Elettrotecnico Nazionale Galileo Ferraris

1997

PROFESSOR BERNARD RENE GUINOT

Honorary Astronomer

Paris Observatory

1998

DR. JACQUES VANIER

National Research Counsel (Retired)

1999

DR. LEONARD S. CUTLER

Agilent Laboratories

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TrueTime, Incorporated

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Incorporated

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International

Dr. Samuel R. Stein

Timing Solutions Corporation

Dr. Paul A. Koppang

Datum, Timing – Test &
Measurement

Dr. Richard L. Sydnor,

NASA Jet Propulsion
Laboratory

Mr. Paul F. Kuhnle

NASA Jet Propulsion
Laboratory

Dr. Andy Wu

The Aerospace Corporation

PTTI 2000 SESSION CHAIRS

SESSION I- Vendor Presentations

MR. ALECK HOLCOMB
TrueTime, Inc.

SESSION II- GPS Augmentation

DR. WILLIAM KLEPCZYNSKI
Innovative Solutions International

SESSION III- GPS and GLONASS Time Transfer

MS. LISA NELSON
National Institute of Standards and Technology

SESSION IV- Time Scales I

DR. DEMETRIOS MATSAKIS
U.S. Naval Observatory

SESSION V – Two-way Satellite Time Transfer

DR. FRANÇOISE BAUMONT
Observatoire de Besançon

SESSION VI- Leap Seconds

DR. DENNIS McCARTHY
U.S. Naval Observatory

SESSION VII – Time Scales II

DR. DEMETRIOS MATSAKIS
U.S. Naval Observatory

SESSION VIII – Advanced Frequency and Time Systems

DR. ROBERT TJOELKER
NASA Jet Propulsion Laboratory

SESSION IX – Future Applications

COMMANDER CHRIS GREGERSON
U.S. Naval Observatory

SESSION X - Telecommunications and Network Timing

MR. ED BUTTERLINE
Symmetricom

POSTER SESSION

DR. ANDY WU
The Aerospace Corporation

PTTI 2000

**THIRTY-SECOND ANNUAL
PRECISE TIME AND TIME INTERVAL (PTTI)
SYSTEMS AND APPLICATIONS MEETING**

TUESDAY, NOVEMBER 28, 2000

- | | |
|--------------------------------|---|
| 0800-0805 | OPENING
Hugo Fruehauf, Zyfer, Inc. |
| 0805-0815 | OPENING REMARKS
Captain B.J. Jaramillo, U.S. Naval
Observatory |
| 0815-0830 | DISTINGUISHED PTTI SERVICE
AWARD Presented by: Joe White, U.S.
Naval Research Laboratory |
| 0830-0835 | CALL TO SESSION
Paul Koppang, Datum-Timing, Test &
Measurement |
| 0835-0900 | KEYNOTE SPEAKER, IN THE
BEGINNING OF GPS , Roger Easton, U.S.
Naval Research Laboratory (retired) |
| SESSION I
0900-1030 | PTTI VENDOR PRESENTATIONS,
Chairman: Aleck Holcomb, TrueTime,
Inc. |
| 1030-1050 | INTERMISSION |
| SESSION II | GPS AUGMENTATION
Chairman: William Klepczynski
Innovative Solutions International |
| 1050-1110 | Paper 1: CAPABILITIES OF THE WAAS
AND EGNOS FOR TIME DISTRIBUTION
AND TIME TRANSFER,
W. Klepczynski, Innovative Solutions
International; E. Powers, U.S. Naval
Observatory; P. Fenton, NovAtel, Canada;
M. Brunet, CNES, France and R. Douglas,
NRC, Canada |
| 1110-1130 | Paper 2: WAAS, EGNOS, MSAS FOR
TELECOM SYNC, H. Fruehauf, Zyfer, Inc. |

TUESDAY, NOVEMBER 28, 2000

- 1130-1150** **Paper 3: MODELISATION AND
EXTRAPOLATION OF TIME DEVIATION
OF USO AND ATOMIC CLOCKS IN
GNSS-2 CONTEXT** J. Delporte, M. Brunet
and Thierry Tournier, Centre National
d'Etudes Spatiales, France; and
F. Vernotte, Observatoire de Besancon,
France
- 1150-1320** **ATTENDEES LUNCH (Provided)**
- SESSION III** **GPS AND GLONASS TIME
TRANSFER, Chairman: Lisa Nelson,
National Institute of Standards and
Technology**
- 1320-1340** **Paper 4: EVALUATING THE ACCURACY
OF GPS CARRIER-PHASE FREQUENCY
TRANSFER USING DATA FROM NIST
AND PTB,** L. Nelson and
J. Levine, National Institute of Standards
and Technology
- 1340-1400** **Paper 5: A TRANSATLANTIC GeTT
TIME TRANSFER EXPERIMENT -
LATEST RESULTS,** R. Dach,
T. Schildknecht and T. Springer,
Astronomical Institute, University of Berne,
Switzerland; and G. Dudle and L. Prost,
Swiss Federal Office of Metrology,
Switzerland
- 1400-1420** **Paper 6: EVALUATION AND
PRELIMINARY RESULTS OF THE NEW
USNO GPS PPS TIMING RECEIVER,**
M. Miranian, E. Powers, L. Schmidt and
F. Vannicola, U.S. Naval Observatory
- 1420-1440** **Paper 7: ABSOLUTE AND RELATIVE
CALIBRATION OF CARRIER PHASE
GPS RECEIVERS,** E. Powers, U.S.
Naval Observatory
- 1440-1500** **INTERMISSION**

TUESDAY, NOVEMBER 28, 2000

- 1500-1520** **Paper 8: RESULTS FROM TIME TRANSFER EXPERIMENTS BASED ON GLONASS P-CODES MEASUREMENTS FROM RINEX FILES**, F. Roosbeek, P. Defraigne and C. Bruyninx, Royal Observatory of Belgium
- 1520-1540** **Paper 9: RECOVERING UTC(USNO,MC) WITH INCREASED ACCURACY USING A FIXED L1-CA CODE GPS RECEIVER**, R. Giffard, Agilent Laboratories
- 1540-1600** **Paper 10: PROGRESS ON A NEW GPS COMMON-VIEW RECEIVER**, M. Weiss, National Institute of Standards and Technology
- 1600-1620** **Paper 11: THE INFUSION OF MCS KALMAN FILTER DATA INTO GPS BLOCK II/IIA FREQUENCY STANDARD ANALYSIS TECHNIQUES**, G. Dieter, G. Hatten and J. Taylor, Boeing Space and Communication Services
- SESSION IV** **TIME SCALES I**
Chairman: Demetrios Matsakis, U.S. Naval Observatory
- 1620-1640** **Paper 12: TIME LINKS FOR THE CONSTRUCTION OF TAI**, J. Azoubib and W. Lewandowski, Bureau International des Poids et Mesures, France
- 1640-1700** **Paper 13: TOWARDS A METHOD FOR COMBINING A GROUP OF TIME TRANSFER LINKS TO FORM AN OPTIMAL COMPOSITE**, J. Davis, S. Shemar, J. Clarke, P. Harris and M. Cox, National Physical Laboratory, United Kingdom
- 1700-1720** **PAPER 14: A REVISED WAY OF FIXING AN UPPER LIMIT TO CLOCK WEIGHTS IN TAI COMPUTATION**, J. Azoubib, Bureau International des Poids et Mesures, France
- 1830-2030** **RECEPTION**

WEDNESDAY, NOVEMBER 29, 2000

- SESSION V TWO-WAY SATELLITE TIME
TRANSFER, Chairman: Françoise
Baumont, Observatoire de
Besançon, France**
- 0800-0820 Paper 15: RESULTS OF A
CONTINUOUS TRANSATLANTIC TWO-
WAY SATELLITE TIME TRANSFER
TEST USING COMMERCIAL SATELLITE
MODEMS, T. Celano, Timing Solutions
Corporation; S. Francis, Zeta Associates;
A. Gifford, National Institute of Standards
and Technology**
- 0820-0840 Paper 16: TWO-WAY FREQUENCY
TRANSFER VIA SATELLITE USING
CARRIER PHASE, W. Schafer,
T. Kuhn and A. Pawlitzki, TimeTech,
Germany**
- 0840-0900 Paper 17: TWSTFT NETWORK STATUS
IN THE PACIFIC RIM REGION AND
DEVELOPMENT OF A NEW TIME
TRANSFER MODEM FOR TWSTFT,
M. Imae, M. Hosokawa and Y. Hanado,
Communications Research Laboratory,
Japan; L. Zhigang, Shaanxi Astronomical
Observatory, China; P. Fisk, National
Measurement Laboratory, Australia;
Y. Nakadan, National Research Institute of
Metrology, Japan; and C. Liao,
Telecommunication Laboratories, Taiwan**
- 0900-0920 Paper 18: REPORT ON THE 8TH
MEETING OF THE BIPM WORKING
GROUP ON TWO WAY SATELLITE
TIME AND FREQUENCY TRANSFER,
W. Klepczynski, Innovative Solutions
International; and W. Lewandowski,
Bureau International des Poids et
Mesures, France**

WEDNESDAY, NOVEMBER 29, 2000

- SESSION VI LEAP SECONDS: PANEL
DISCUSSION**
**Chairman: Dennis McCarthy, U.S.
Naval Observatory**
- 0920-0930 Paper 19: RELATING TIME TO THE
EARTH'S VARIABLE ROTATION, H.
Chadsey and D. McCarthy, U.S. Naval
Observatory**
- 0930-0940 REASONS FOR A CHANGE,
D. McCarthy, U.S. Naval Observatory**
- 0940-0950 REASONS NOT TO CHANGE,
S. Malys, National Imagery and
Mapping Agency**
- 0950-1020 OPEN DISCUSSION**
- 1020-1040 INTERMISSION**
- SESSION VII TIME SCALES II**
**Chairman: Demetrios Matsakis, U.S.
Naval Observatory**
- 1040-1100 Paper 20: A TOTAL ESTIMATOR OF
THE HADAMARD FUNCTION USED
FOR GPS OPERATIONS, D. Howe,
National Institute of Standards and
Technology; R. Beard, U.S. Naval
Research Laboratory; C. Greenhall, Jet
Propulsion Laboratory; F. Vernotte,
Observatoire de Besancon, France**
- 1100-1120 Paper 21: ON DEVELOPING AN
INTEGRATED IGS FREQUENCY SCALE,
K. Senior and D. Matsakis, U.S. Naval
Observatory**
- 1120-1140 Paper 22: PERFORMANCE AND
CHARACTERIZATION OF U.S. NAVAL
OBSERVATORY CLOCKS, L. Breakiron
and D. Matsakis, U.S. Naval Observatory**
- 1140-1300 ATTENDEES LUNCH (Provided)**

WEDNESDAY, NOVEMBER 29, 2000

SESSION VIII ADVANCED FREQUENCY AND TIME SYSTEMS

Chairman: Robert Tjoelker, NASA Jet Propulsion Laboratory

1300-1320 Paper 23: THEORETICAL AND EXPERIMENTAL STUDY OF LIGHT SHIFT IN CPT-BASED RB VAPOR CELL FREQUENCY STANDARD, M. Zhu and L. Cutler, Agilent Laboratories

1320-1340 Paper 24: PRELIMINARY RESULTS FROM THE USNO ATOMIC FOUNTAIN DEVELOPMENT PROJECT, T. Swanson, E. Burt, and C. Ekstrom, U.S. Naval Observatory

1340-1400 Paper 25: STABILIZED REFERENCE FREQUENCY DISTRIBUTION FOR RADIO SCIENCE WITH THE CASSINI SPACECRAFT AND THE DEEP SPACE NETWORK, M. Calhoun, R. Wang, A. Kirk, G. Dick, and R. Tjoelker, NASA Jet Propulsion Laboratory

1400-1420 Paper 26: A 100 GHZ LOW PHASE NOISE CLOCK BASED UPON SUPERCONDUCTING ELECTRONICS, J. Luine, D. Durand, R. Sandell, A. Smith, J. Ostrick, and M. Wire, TRW Space and Electronics Group

1420-1440 INTERMISSION

**1440-1640 POSTER SESSION
Chairman: Andy Wu, The Aerospace Corporation**

Poster 1: THE TIME LINKS BETWEEN CSAO AND CRL — TWSTFT AND GPS COMMON VIEW, L. Huanxin and W. Zhengming, Shaanxi Astronomical Observatory, China

WEDNESDAY, NOVEMBER 29, 2000

**Poster 2: DISCRIMINATING A
GRAVITATIONAL WAVE
BACKGROUND FROM INSTRUMENTAL
NOISE IN THE LISA**

INTERFEROMETRIC DETECTOR,
M. Tinto, J. Armstrong, and F. Estabrook,
NASA Jet Propulsion Laboratory

**Poster 3: TIME AND FREQUENCY
ACTIVITIES AT THE CSIR - NATIONAL
METROLOGY LABORATORY,** E. Marais,
CSIR - National Metrology Laboratory,
South Africa

**Poster 4: THE DEVELOPMENT OF
MULTI-CHANNEL GPS RECEIVERS AT
THE CSIR - NATIONAL METROLOGY
LABORATORY,** E. Marais, CSIR -
National Metrology Laboratory, South
Africa

**Poster 5: USNO ALTERNATE MASTER
CLOCK (AMC) STEERING,** S. Hutsell,
USNO Alternate Master Clock; and
P. Koppang, Datum-Timing, Test &
Measurement

**Poster 6: ONE-WAY GPS TIME
TRANSFER 2000,** S. Hutsell, USNO
Alternate Master Clock; Captain M. Rivers
and 1 Lt T. Kelkenberg, U.S. Air Force

**Poster 7: OVERVIEW OF RESEARCH
ACTIVITIES ON TIME AND FREQUENCY
AT COMMUNICATIONS RESEARCH
LABORATORY,** M. Hosokawa, N. Kotake,
K. Imamura and N. Kurihara,
Communications Research Laboratory,
Japan

**Poster 8: MULTI-PURPOSE TIME
ANALYZER AND MONITOR FOR DEEP
SPACE NETWORK TIME**

SYNCHRONIZATION, J. Gonzalez, Jr.,
M. Calhoun, S. Cole, and R. Tjoelker,
NASA Jet Propulsion Laboratory

**Poster 9: ON-ORBIT FRACTIONAL
FREQUENCY SHIFTS OF PRECISION
CRYSTAL OSCILLATORS**, W. Stapor,

B. Henson, M. Frank and P. McDonald,
Innovative Concepts Inc.; and
G. Snyder, U.S. Naval Research
Laboratory

**Poster 10: CURRENT STATUS OF
MILLISECOND PULSAR OBSERVATION**

AT CRL, Y. Hanado, Y. Shibuya, M.
Hosokawa, M. Sekido, and M. Imae,
Communications Research Laboratory,
Japan

**Poster 11: GPS COMMON-VIEW AND
MELTING-POT TIME TRANSFER USING**

ONCORE UT+ RECEIVERS, F. Meyer,
Observatoire de Besancon, France

**Poster 12: GPS-BASED TIME ERROR
ESTIMATES PROVIDED BY
SMOOTHING, WIENER AND KALMAN
FILTERS: A COMPARATIVE STUDY,**

Y. Shmaliy, Guanajuato University,
Salamanca, Mexico; A. Marienko,
"Sichron" Center, Kharikiv, Ukraine; and
O. Ibarra-Manzano, Guanajuato
University, Salamanca, Mexico

**Poster 13: ROA TWSTFT STATION.
SET-UP AND FIRST RESULTS,**

J. Palacio and F. Galindo, Real Instituto y
Observatorio de la Armada, Spain

**Poster 14: CLOCK SYNCHRONIZATION
USING GPS/GLONASS CARRIER**

PHASE, K. Tu, H. Peng and C. Liao,
Chunghwa Telecom, Taiwan; and
F. Chang, National Taiwan University

WEDNESDAY, NOVEMBER 29, 2000

- 1730-1830** **Joint PTTI Executive Board and
Advisory Board Meeting**
- 1900-2030** **Evening Speaker, SELLING THE TRUE
TIME IN 19TH CENTURY AMERICA, Ian
Bartky**

THURSDAY, NOVEMBER 30, 2000

- SESSION IX** **FUTURE APPLICATIONS
Chairman: Chris Gregerson, U.S.
Naval Observatory**
- 0800-0820** **Paper 27: ISSUES NECESSITATING
A COMMON TIME REFERENCE IN
THE U.S. NAVY, S. Linsenmeyer, U.S.
Naval Sea System Command,
C. Gregerson, U.S. Naval Observatory;
and R. Beard, U.S. Naval Research
Laboratory**
- 0820-0840** **Paper 28: COMMON TIME REFERENCE
TECHNOLOGY FOR SYSTEMS
INTEROPERABILITY, R. Beard and
J. White, U.S. Naval Research Laboratory**
- 0840-0900** **Paper 29: OVERVIEW AND
COMPARISON OF EMERGING
CLOCK TECHNOLOGIES, C. Ekstrom
and E. Burt, U.S. Naval Observatory**
- 0900-0920** **Paper 30: DEVELOPMENT AND
EVALUATION OF GPS SPACE CLOCKS
FOR GPS III AND BEYOND, B. Feess
and A. Wu, The Aerospace Corporation**
- 0920-0940** **Paper 31: INNOVATIVE
APPLICATION OF QUANTUM
CASCADE LASER TECHNOLOGY AS
PRECISION CLOCKS, T. Gates,
W. Stapor, B. Henson, and
P. McDonald, Innovative Concepts Inc.;
and J. Schultz, Battelle**
- 0940-1000** **Paper 32: FREQUENCY STABILITY
REQUIREMENTS FOR NARROW
BAND RECEIVERS, W. Klepczynski,
Innovative Solutions International; and
P. Ward, Navward Systems**
- 1000-1020** **INTERMISSION**

THURSDAY, NOVEMBER 30, 2000

SESSION XI	TELECOM AND NETWORK TIMING Chairman: ED BUTTERLINE, Symmetricon
1020-1040	Paper 33: THE NANOKERNEL D. Mills, University of Delaware; and P. Kamp, The FreeBSD Project
1040-1100	Paper 34: USING THE NETWORK TIME PROTOCOL (NTP) TO TRANSMIT INTERNATIONAL ATOMIC TIME (TAI), J. Levine, National Institute of Standards and Technology; and D. Mills, University of Delaware
1100-1120	Paper 35: USNO GPS/ATOMIC NTP STRATUM-1 SERVERS, R. Schmidt, U.S. Naval Observatory
1120-1140	Paper 36: PRIMARY REFERENCE CLOCKS USING INDOOR ANTENNAS, G. Zampetti, Symmetricon
1140-1150	CLOSING SESSION
1150-1200	CLOSE OF MEETING

Notes

Notes

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